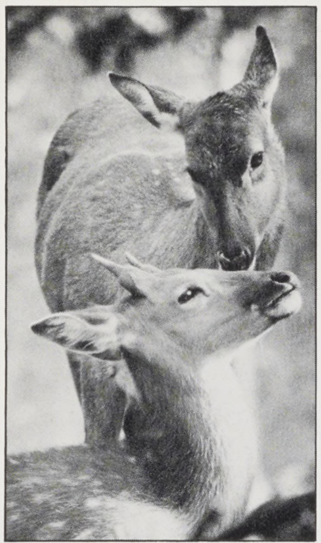
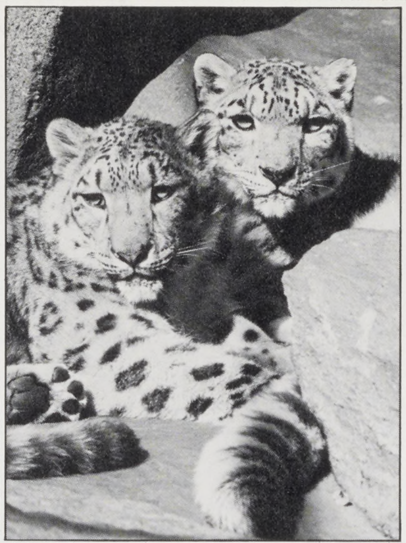


Formosan Sika deer



Snow leopard

CRES
THE CENTER FOR REPRODUCTION OF ENDANGERED SPECIES
REPORT

P.O. Box 551, San Diego, California 92112

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Infectious Disease Research a Key Element of CRES

Although the *reproduction* of self-sustaining groups of endangered species is the main goal of CRES, protecting the health of these valuable animals is vital to successful breeding efforts. The study and treatment of infectious diseases—many of which can rapidly attack a particular species, or worse, spread to other species nearby—is a critical element of the CRES program. Projects currently being conducted by lead microbiologist Dr. Werner Heuschele and virologist Dr. Michael Worley and their staff dramatically illustrate the significance of such work.

Sika Deer Focus of Virus Studies

The Formosan sika deer once ranged the lowlands of Taiwan in substantial numbers. However, since 1969, this handsome spotted deer has been extinct in the wild, the victim of over-hunting for its meat and antlers.

Ironically, the species has not been difficult to breed in captivity. Almost 60 of its type have been born at the San Diego Wild Animal Park in the last decade. But recent outbreaks of a deadly and highly-contagious disease called malignant catarrhal fever (MCF) cause a serious threat to this and certain other hoofed species.

> ***provided an increased understanding of the disease and made important improvements in procedures to diagnose and identify animals which act as carriers for it.***

MCF, which also affects domestic cattle, is due to a herpesvirus that is sporadic and poorly understood. In attempting to overcome the problem, Dr. Heuschele had first to isolate the virus, then produce cell cultures in volume for laboratory study, a time-consuming process which took over eight months to complete. In the successful isolation process, Dr. Heuschele provided an increased understanding of the disease and made important improvements in procedures to diagnose and identify animals which act as carriers for it.

An unforseen but significant sidelight of Dr. Heuschele's work has been the observation that the MCF virus also caused the development of cancer in the lymph cells of a Formosan sika deer and

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Needed:		
	$1,632—Cell culture roller apparatus	Dr. Werner Heuschele
	7,660—Ultracentrifuge rotor	Dr. Michael Worley

Success in defeating two serious viruses—the herpes strain that causes malignant catarrhal fever in some of our hoofed animals, and a hepatitis strain that attacks the big cats—rests in large part on obtaining an *ultracentrifuge rotor* for the purification of virus samples and a companion *four-tiered cell culture roller* apparatus. These special items will enable Drs. Heuschele and Worley of our virology laboratory to culture pure virus strains in a quantity 20 to 100 times greater than is now possible. Cost for this equipment is modest for results that could benefit not only the animals in our collection, but affected animals throughout the world.

Condor Chicks Thrive; *Sexing Tests Continue*

Sisquoc, the history-making first California condor chick hatched in captivity, and a more fragile second hatchling Tecuya are doing well according to round-the-clock condor watchers at the San Diego Wild Animal Park. Both chicks are thriving in their see-through incubator homes and have shown healthy appetites. The voracious Sisquoc more than doubled its weight in a one-week period.

In an attempt to determine the sex of the chicks, CRES scientists mounted a two-pronged effort using experimental testing methods. Avian reproductive physiologist Dr. Arden Bercovitz utilized a bird sexing technique pioneered at the center which

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(Infectious Disease Research cont.)

other animals. This finding identifies yet another herpesvirus which in some instances produces serious illness and in other less common circumstances may induce cancer development.

The ultimate goal of the virology staff is to develop a vaccine against MCF, but they also intend to compare the basic biology of the MCF virus with that of other herpesviruses of animals.

Disease of Exotic Cats Linked to Virus

During the last year, Dr. Worley's attention has focused on another serious disease problem which is thought to cause liver cirrhosis in the magnificent snow leopard, cheetah and other endangered species of large cats. In studies of a virus related to human hepatitis B (HBV), Dr. Worley has made significant progress toward understanding the factors involved in the development of the chronic liver disease, a frequently fatal occurrence for the cats it affects.

> ***significant progress toward understanding the factors involved in the development of the chronic liver disease***

Analyzing blood samples for HBV antibodies, he noted that approximately 27% of samples from 240 exotic felines indicated exposure to the virus, with an even higher 70% noted among snow leopards alone.

Results strongly suggest that an HBV-like virus does exist in several exotic cat species and may be a contributing factor in the prevalence of the lethal liver problems. As in the case of MCF, CRES virologists eventually seek to develop a vaccine which will counteract this threat to wildlife.

Future Studies

Other investigations by the infectious disease division are concerned with a viral disease of chickens which is also thought to plague ostriches and related bird species and toxoplasmosis, a parasite which recently caused the death of a ring-tailed lemur.

Added to projects now ongoing, future plans include the study of equine herpesvirus-1, a disease which is suspected of causing spontaneous abortion among rare horse species.

(Condor Chicks cont.)

traces hormones in bird wastes. At the same time, genetics technician Arlene Kumamoto began a cell-culturing process using membrane from the hatched egg shell in an effort to identify sex chromosomes. Neither test was conclusive, however, and scientists will now wait for the chicks to gain strength before employing traditional blood sampling tests.

The much-publicized condor chicks increase by 10% the estimated 20-member total for the severely endangered raptor and provide a milestone in an ambitious joint-venture condor recovery program.